2020 SALISBURY CASE STUDY SUMMARY ECOLOGICAL REPORT

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Introduction

The Salisbury property is located on the floodplain and associated relict red duplex terraces of the Marra Creek, to the west of the Macquarie Marshes about 160 km north-west of Warren in north-central New South Wales. The Queensland border is about 160 km further north. Marra Creek runs through the region, adjoins Salisbury on the property's western side and potentially flows north into the Barwon River, a tributary of the Darling River.

The two general soil types on Salisbury are a dark heavy clay soil that is relatively impervious to erosion and red soils with a highly erodible sandy upper horizon over a finer red clay lower horizon. Large areas of the red soil are, or have been, degraded by wind and water erosion.

There are no permanent watercourses on Salisbury. Average annual rainfall is about 450 mm on the property or 405 mm as measured at the nearest meteorological station. The median annual rainfall is only 263 mm and records of highest daily falls show that rainfall tends to occur in infrequent large falls, commonly exceeding 50 mm/day in winter-spring months and exceeding 100 mm/day in summer-autumn months.

The native vegetation is sparse woodland with common tree species including poplar box (*Eucalyptus populneus*), leopardwood (*Flindersia maculosa*), wilga (*Geijera parviflora*), western rosewood (*Alectryon oleifolius*, also known as bullock bush), warrior bush (*Apophyllum anomalum*) and wild orange (*Capparis mitchelii*). The most widespread low ground cover is old man saltbush (*Atriplex nummularia*) and bladder saltbush (*A. vesicaria*). There is a wide range of herbaceous plants and grasses, including Mitchell grass (*Astrebla* spp.). The perennial saltbushes and Mitchell grass give the property a natural resilience to drought when managed well.

Key findings

The ecological values assessed include resilience to disturbance and soil nutrients, hydrology and biology. Because little empirical data was available to the authors at the time of writing, the assessment is necessarily based on observations and subjective judgement of likely effects of management.

The condition of all values assessed is assumed to be poorer than when sheep grazing commenced in the 1800s. This assumption is based on the set stocking strategy used over a long period, leading to loss of soil structure, hydrological function and biological values, combined with negligible fertiliser inputs and limited pasture improvements. Severe scalding of the red duplex soils resulted from overgrazing under previous management. This assessment places special emphasis on the reclamation of these scalded areas by a technique known as waterponding.

The ecological assessment identified four phases of land management.

- Phase one: The pre-European phase that ended when the first pastoral settlers arrived some time from about 1830 to 1850.
- Phase two: Conventional management was used until about 1972, by which time there was widespread degradation from overgrazing, leading to the formation of hard-packed “scalds” with negligible vegetation cover.
- Phase three: In 1972 efforts to reclaim scalded areas and to control grazing pressure began.
- Phase four: The final phase is in the future when results of waterponding, capping artesian bores and controlling grazing pressure are expected to become increasingly evident.

Summary of improvement

All functional criteria are considered to have improved since 1972. For example, since the widespread adoption of regenerative practices in 2009:

- the property is becoming more resilient to drought (Criterion A). A similar conclusion is likely for flood proofing
- soil health and function has gradually improved
- vegetation biodiversity has stayed much the same during the waterponding operations
- pasture status has gradually improved (from zero) in the ponded areas, due to increased ground cover and herb species richness.

The reproductive potential of the plant species and plant community has similarly improved.

More improvement in these values is expected in future, particularly when drought conditions ease. Further rainfall will serve to leach salts from surface layers of the scalds as well as provide an essential input for plant growth.